A Corporate Publication of Santee Cooper

PowerSource

FALL 2002

Customer Service—
Meeting Their Needs…and a Whole Lot More

The Customer is Number One...

No five words better express the topmost commitment of any company.

Whether it involves manufacturing a product, performing an operation or providing a service, meeting the needs and expectations of the customer has to be a high priority.

For Santee Cooper, providing top-quality customer service is an essential part of our mission statement, which states our goal is to help improve the quality of life for the people of South Carolina. That viewpoint was presented to us in the enabling legislation that created Santee Cooper in 1934, and it has evolved as a mandate that means putting our customers and the people of South Carolina foremost in all that we do.

Through our service to customers and to the people of South Carolina, our focus centers on three major attributes: low rates, being easy to do business with and dependability. After all, these factors best define who we are and what we're all about.

John H. Tiencken Jr.
President and Chief Executive Officer

These three factors are borne out by the facts. (1) Santee Cooper's rates are among the lowest in the nation (2) Santee Cooper belongs to the people of South Carolina and we work for them and (3) Santee Cooper provides what customers say they value most: "dependable power... dependable people."

Through a variety of methods, we make every effort to listen to our customers and provide the variety of services that best meet their needs. We regularly conduct research to find out what customers are interested in, what attributes they look for in their utility and what they consider most important in the services provided by their utility. We welcome their input, expressions of concern and feedback relating to the services we provide.

In fact, an independent survey of customers conducted annually gives us a snapshot of how well we are doing in meeting the needs of our customers. We are proud of the extremely high ratings received, which reflects the dedication and hard work of our employees.

In this issue of PowerSource, we feature customer service and how the customer plays a central role in our day-to-day operations and as part of our long-term goals.

Santee Cooper POWER

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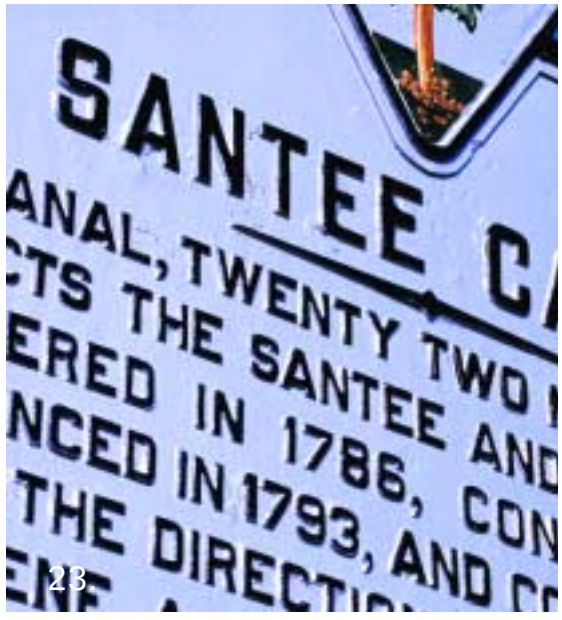

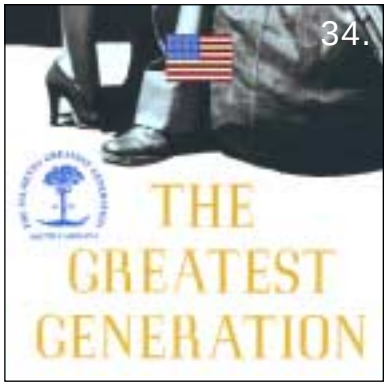

***Cover**: Sabrina Seay, office manager of retail and marketing in the Berkeley District, offers two brochures that promote Santee Cooper's perspective towards quality service in meeting customer needs.*

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The Customer Comes First...

No four words better express the topmost commitment of any company. Whether it involves manufacturing a product, performing an operation or providing a service, meeting the needs and expectations of the customer has to be the number-one priority.

For Santee Cooper, providing top-quality customer service is an essential part of its mission statement, which says the corporate goal is to help improve the quality of life for the people of South Carolina. That viewpoint was presented in the enabling legislation that created Santee Cooper in 1934, and it has evolved as a mandate that means putting customers and the people of South Carolina foremost in all the utility does.

"Always do more than is required of you."

—General George S. Patton

Through its service to customers and to the people of South Carolina, three major factors are the focus of the utility's customer service efforts. They are low rates, easy to do business with and dependability. "After all, this focus best defines who we are and what we're all about," says Executive Vice President and Chief Operating Officer Bill McCall.

McCall says it's not difficult to know where to focus because the proof is in the pudding. "We monitor and measure the quality of our customer service on a regular

Left: Charles Hardee, meter installer, completes the electrical service connection for a new Conway customer.



Friendly, helpful employees provide assistance and information to Santee Cooper customers. ***Top, from left***: are Marketing Representative Michael Goff and Customer Service Representatives Frances Stevens and Stephanie Packingham. ***Bottom, from left***: Senior Customer Service Representative Mark Peterson and Customer Service Representatives Shelton Hytower and Sherry Rabon.

basis and that allows us to fine-tune how we operate and how we respond to customer needs," says McCall.

Measuring Service Through Surveys

Customer input is used to constantly craft the high level of services Santee Cooper customers have grown to expect. An annual independent customer survey gives Santee Cooper a snapshot of how well it is doing to meet the needs of its customers. "We are proud of the extremely high ratings received, which reflects the dedication and hard work of our employees. It all translates into a quality of service with the highest standards," says McCall.

Research plays an important role in how Santee Cooper approaches customer service. The annual survey has been conducted since 1992 to measure customer satisfaction, customer loyalty and perceptions of Santee Cooper. It's important at Santee Cooper to know what customers think and what they want.

From the 2001 survey, Santee Cooper continues to maintain high satisfaction levels among the residential customers. According to the results provided by MarketSearch of Columbia, S.C., Santee Cooper's "Overall Satisfaction Index" is significantly higher than the national norm.

Among electric utilities, Santee Cooper has the highest overall satisfaction rating in the state.

Findings in the survey's customer service section indicate satisfaction with Santee Cooper's customer service is high, particularly at the "very-satisfied" level. At least three out of four customers say they are very satisfied with the utility's response to customers' questions or problems, customer treatment on the phone or in person, and the hours of operation.

"It shows in the survey results just how well our employees have shown consistently positive results in how they conduct business with the customer," says McCall.

The survey also pinpointed several areas where changes could be made to better accommodate customer needs. Over the years, Santee Cooper has made several improvements based on these findings. For example:

- The retail bill was redesigned to make it easier for the customer to read and understand.
- Santee Cooper launched the Green Power Program in response to increased customer interest in renewable energy and concern for the environment.
- Customers said they wanted more convenient office hours. So, hours of operation for Santee Cooper's eight customer service offices were extended one hour, 30 minutes earlier in the morning and 30 minutes later in the afternoon.

Customer Plays a Central Role

Zack Dusenbury, vice president of retail operations, says that throughout Santee Cooper, the customer plays a central role in the day-to-day operations and as part of the utility's long-term goals.

"In customer service, our goals are to operate efficiently, be courteous and friendly to our customers, and make doing business an easy process," says Dusenbury. "Santee Cooper's employees are encouraged to treat their customers just as they would want to be treated. It's the Golden Rule."

In addition to providing what customers expect, says Dusenbury, it is good to follow the advice that General George S. Patton offered to his troops: "Always do more than is required of you." Following that rule of thumb has paid off for Santee Cooper in its quest for providing a quality of customer service second to none.

"When I first came to work at Santee Cooper over 30 years ago, my supervisor gave me some wise advice. He said that the relationship we have with the customer is very fragile," says Dusenbury. "And he was so right. It is important to respond to our customers' needs in a timely and friendly manner."

Changing with Technology

Technology has helped change the way Santee Cooper provides excellent customer service.

"What upsets a customer the most is when the power goes out. When a customer comes home from work and finds the videocassette, alarm clock and microwave oven flashing 12:00, that's a sure indication there's been a power outage," says Dusenbury. "But with Santee Cooper's 2001 distribution reliability at 99.994 percent that occurrence is rare."

Dusenbury points to areas where technology has helped improve customer service:

- Meter readers use wireless transmitters to remotely read some 9,000 meters.
- Power outages can be reported by simply dialing a toll-free number.
- Customers can pay their bills by using "e-Billing" on the Internet.
- Energy audits can be performed through the Internet without having to make an appointment with a marketing representative.

In 1995, Santee Cooper added its 100,000th retail customer. To commemorate that achievement, Zack Dusenbury, vice president of retail operations, is shown as he helped plant a dogwood tree, presented to the Surfside Beach couple who had moved to the area from New York. Since this milestone event, the number of retail customers has increased to more than 132,000.

Reaching Beyond the Customer Service Office

Customer service extends beyond the customer service offices. Meter readers, line technicians and residential and commercial marketing representatives are just a few of the other employees who have regular contact with customers.

"A reason Santee Cooper has been so successful in customer service and satisfaction and has a good corporate image is because of all of the good employees who take pride in their work and respond positively to customer needs," says Dusenbury.

An example of employee concern was expressed in a letter of thanks from a Garden City Beach area customer. On a hot August Saturday last summer, as over 150,000 vacationers enjoyed the Grand Strand, his power went off. He noted that after he reported the power outage, "within 30 to 45 minutes your service truck arrived. We felt this was a prompt reply to our problem especially considering a Saturday and in the heat of a very hot day."

The customer said that the line technician worked diligently "in 90-degree temperature in the sun" to find the source of the problem and fixed it quickly.

"We felt we received outstanding service from a very skilled Santee Cooper representative. In engaging her in conversation while she worked, we found her to be so very friendly, and also a dedicated Santee Cooper employee," the customer said.

A letter from another satisfied customer echoed the same level of

satisfaction. "As a retired division manager with AT&T, I appreciate excellent customer service." He went on to recall how early in the afternoon on July 4 his two heat pumps failed and some of his electrical devices were acting strangely. "I phoned your emergency dispatch explaining the predicament and was instructed to 'pull my main circuit breaker' and given a promise that someone would be at my house within an hour. Thirty minutes later help arrived."

He concluded, "By 6 p.m. I had full service! A task well done!"

"It's letters like these that reaffirm what we believe is the core to good customer service. That's operating efficiently, being courteous and friendly to the customers, and being easy to do business with," says Dusenbury. "It's all spelled out clearly in how we do business and in our branding messages. It's what the customers want and what we promise to deliver — Dependable Power. Dependable People."

Advisory Committee Provides Boost to Customer Relations

Over 10 years ago, Santee Cooper formed a Customer Advisory Committee whose members serve as ambassadors, taking information about Santee Cooper out into the communities where they work and live. They spread the word about Santee Cooper's mission, programs and services and share what they learn with other Santee Cooper customers.

Communications between Santee Cooper and the advisory committee is a two-way street. They provide a helpful customer perspective including insights, opinions, concerns and special needs they see in the community. Their recommendations do carry weight. "We listen to their concerns and feedback," says Santee Cooper's Jill Watts, director of customer communications.

The committee is comprised of of approximately 45 members from Horry and Georgetown counties. They represent both residential and commercial customers and have varied backgrounds, some working in the health care, financial, engineering or retail sectors.

During the past 10 years, the Customer Advisory Committee has toured many of Santee Cooper's locations, including generating stations, control rooms and customer service offices. The group gathers quarterly to hear updates on current industry topics. Their agenda also focuses on utility operations, hurricane preparedness, rates, marketing programs and environmental efforts at Santee Cooper.


NORTH
ATLANTIC
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COLOMBIA
CENTRAL
AMERICA
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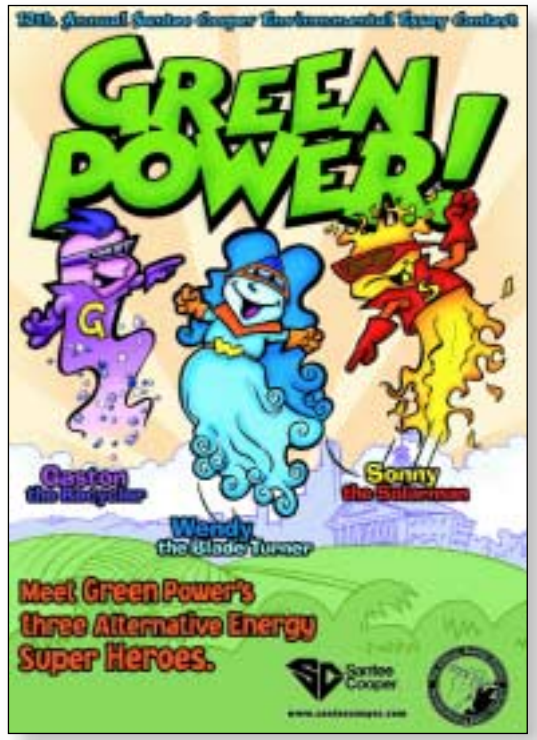
PERU
SOUTH
AMERICA

Seventh-Grader Takes 'Out-of-World' Look at Green Power Potential

Michelle Green selected as Santee Cooper environmental essay contest winner.

She stepped into the outreaches of our galaxy to ponder the future of energy and the environment. Putting pen to paper, she expressed her perspective on what would happen should the U.S. run out of oil and what alternatives should be considered to maintain energy sufficiency — while protecting the environment.

More than 3,000 seventh-graders, representing about 70 schools statewide, submitted essays on the subject of Green Power. The following essay, written by Michelle Green, a student at R.C. Edwards Middle School in Central, S.C., was judged the overall statewide winner in Santee Cooper's 12th Annual Environmental Essay Contest.



The year was 4127. The planet: Earth. And it was running out of a power supply fast. They had been using oil for the past 1,100 years or more.

The world leader of countries like Mandatroit, Syron and Digulen, were gathered to decide what should be done.

The leader of Neuren, President Aulder said, "We must stop this catastrophe!"

"Yes, but how?" replied Raela, the ambassador of Syron.

"I propose we find another power source," suggested Zeuron, dictator of Engulaid.

"Ha! There is no other power source!" said Aulder smugly.

"As a matter of fact, there is," mumbled a raspy voice from the corner of the room.

***Left**: A world globe, representing the universal habitat, is presented to each Congressional District winner in Santee Cooper's annual environmental essay contest. They also receive a U.S. Savings Bond, and an equal amount is presented to their school.*

It was Givalder, an elder. He wasn't really a leader, but he was so old and wise that he was invited anyway.

"There is or there was at one time," he muttered, somewhat regretfully, "Do you have a holo-projector?" A projector was a device that allowed one to see a three-dimensional image.

"Yes, we do," said Raela.

"Well, I have a video/audio chip for you to see." Givalder inserted the chip into the projector. At first, it was only a static blob, then it began to clear. It showed a middle-aged man in ancient clothes. He spoke in a confident voice.

"Hi! I am a worker for a company called Santee Cooper. This year is 2002. We have come up with an alternative energy idea called Green Power. Instead of using petroleum and fossil fuels, we can use solar energy, wind power and landfill gas energy."

"Green Power? What in heaven's name is that?" moaned Zeuron incredulously.

"LISTEN and WATCH," said Givalder as harshly as he could manage, which wasn't very harsh, being an old man and all.

"Green Power is a program to improve human health, preserve the earth for our descendants, reduce environmental impact, and to conserve fossil fuel resources," the strange man went on. "The alternative energy resources will replace themselves naturally, therefore not producing any pollution."

"Wait," interrupted Aulder. "Stop the holoproject, Givalder."

"Yes?" the old man inquired.

"Well, I understand the basic idea of not using fossil fuels, but what about solar power? And wind energy and that—landfill power, was it? I want to know more about them."

The wise Givalder saw that they were becoming curious. He pointed to the 3-D image.

"Solar energy is gathered by mirrors or solar cells. Solar cells consist of materials that absorb sunlight and makes electrons move away from their atoms, causing electricity. The energy produced by the sun in one day can meet the needs of the earth's power needs for four decades! However, it's only available when it is sunny. Backup sources are needed for night and cloudy weather.

Another source is wind energy. This can be used to turn a turbine and create energy. Wind power plants (wind farms) can produce great amounts of this energy. But the windmills can be noisy and are easily damaged by strong winds, plus the fact that some places may not get enough wind to use it well."

The leaders looked quite impressed at this point and stared earnestly at the man.

"Yet another source is methane gas, or landfill gas, created when waste decomposing in a landfill is available. It |can be captured and used for generating electricity, heat, steam and to fuel vehicles. Landfill gas prevents emissions such as sulfur dioxide from causing acid rain and air pollution, being the only energy supply that can remove pollution.

We need these alternatives to help the U.S. become less dependent on foreign oil trade, and so we can preserve Earth. What if we run out of oil? What then? We will have no energy to establish new sources!" The stranger spoke so passionately and sincerely that it was hard to believe that he wasn't there.

"We could build more recycling centers, make more solar powered cars, limit fossil fuel use. All these would help Green Power to take shape in South Carolina."

The image flickered and died. The leaders looked as if in a trance.

"A few years after this idea was becoming more successful, people discovered a fossil fuel deposit. They abandoned Green Power because they thought they'd never run out of oil," said Givalder. "They didn't care for the future, so we're now running out. I tried to reintroduce the idea, but no one listened. Now the time has come to make a choice."

"I think it's an excellent idea. All in favor say, aye," said Aulder.

"Aye!"

"Then we must inform the people," offered Givalder.

"Wait! What is the U.S.?" inquired Raela.

"An ancient country that is now Digulen," chuckled Givalder.

And with that, the world leaders went to publicize their idea, Green Power.

Michelle Green, overall statewide winner in Santee Cooper's 12th annual Environmental Essay Contest.

Any teacher interested in having their students participate in next year's Environmental Essay Contest should send an email message to bfondren@santeecooper.com

Giant Cement: Producing Infrastructure for a Growing Southeast

June 25 was a big day in the long history of Giant Cement, one of Santee Cooper's 32 large industrial customers, located in Dorchester County's Harleyville community.

The occasion was the announcement of a $100 million dollar modernization, welcome news in a regional and statewide business climate that's endured its share of blustery economic weather this year.

The project entails replacing four raw mills and four wet-process kilns with a brand-new raw mill and a new preheater, precalciner kiln with a production capacity of 3,000 tons per day. A new finish mill is the final touch on the extensive makeover.

"Investing in this plant will make us more competitive in an increasingly global cement industry," says Terry Kinder, president and chief executive of Giant Cement Holding Inc.

"The quality and quantity of our limestone reserves here, and the quality of the work force were key. This move will also allow us to serve our many loyal customers more effectively."

***Left**: Between 20 and 60 million years of geology are captured in this strata of limestone along the walls of the Giant Cement quarry near Harleyville.*

Approximately 225 people are employed at the facility. Kinder, who works out of the company's Summerville office, indicated it is undetermined if new jobs will be created because of the facelift. Even if it does not, laying out those kind of bucks in a plant is proof-positive of a company's confidence in the Harleyville location, confidence that provides a solid foundation for the long-term.

"This upgrade represents the fifth time the plant has been upgraded since it began here way back in 1945," says Kinder, a 16-year veteran with the firm. "Our market for the facility is South and North Carolina, and Georgia."

President and Chief Executive Officer Terry Kinder.

Portland and masonry cement is their product with about 85 percent the Portland variety and 15 percent the masonry type. It leaves the plant primarily in bulk, the majority by truck and the rest by rail. The Harleyville facility's product leaving by rail generally goes to the Raleigh-Durham, N.C. areas, or to Atlanta, Ga. Raleigh-Durham and Atlanta are also where bag warehouses are located along with one in Charlotte, N.C.

The product is bagged and purchased by builders and other customers. Portland cement is made by burning and grinding a mixture of limestone and clay. Cement hardens when introduced to water, which causes a chemical reaction binding the sand and gravel in concrete together.

Portland cement typically ends up in highways, bridges and sidewalks. For example, Redi-Mix concrete is made from

***Above**: The limestone quarry, adjacent to the plant, is the prime source of the material used in Giant's manufacturing of cement. Safety Director Bruce Sellers inspects the condition of the limestone deposits following heavy rains. **Bottom, right**: A bulldozer in the quarry loads limestone onto a mile-long conveyor that transports it to the plant.*

Portland cement. Masonry cement is slightly different because it is slower setting and is used for laying bricks and blocks. In some cases, it is used in stucco construction. Much of the masonry product is bagged and purchased by builders and other customers.

All concrete is made from cement, simply defined as a material formed with a mixture of cement, sand, water and aggregate.

"The production of cement is a critical component of a modern, thriving economy," Kinder says. "It's something the country really needs and we're proud to be a part of the growth and development occurring in the Lowcountry, the state and the Southeast."

The Lowcountry key is the limestone deposits. That's why Giant is there. The limestone Giant uses formed approximately 20 million years ago. During that time the Lowcountry was covered by an ancient ocean whose waves lapped the shore around present-day Columbia.

The limestone in Harleyville is a very soft rock. Its consistency is primarily calcium carbonate, typically composed of the organic remains of sea creatures. If enough heat and pressure are applied to limestone, it turns into marble. Heat is a big part of Giant's manufacturing process. The kilns fire up to 3,500 degrees Fahrenheit to heat the raw materials.

Mining is done at Giant's 1,800-acre facility where the 300-acre quarry provides the raw material to make cement.

"We mine down to about 80 feet below the surface," says Kinder. "We have chosen not to mine deeper and we're very conscientious of the environment here."

In fact, the plant's modernization, while producing roughly 25 percent more product, will mean an eventual 62 percent reduction in nitrogen oxide emissions and a 60 percent cut in sulfur dioxide emissions.

Operator Sean Riley loads bags into the machine that fills and outputs 80-pound bags of cement at the rate of one per second.

"We will be spending millions and millions of dollars to cut down emissions," says Kinder. The environmental aspect of Giant in the Lowcountry can also be found in Harleyville, where Giant Resource Recovery is located with a work force of 40.

"That is where industrial waste materials are recycled, materials used as fuel for the kilns in the cement manufacturing process," Kinder says. "We're primarily a cement manufacturing company, but by taking these materials and keeping them from a landfill, we're doing something positive."

Involvement in the community is a tradition spanning four decades at Giant, active in chambers of commerce and the nearby Francis Beidler Forest, owned and operated by the Audubon Society. Giant has distributed dictionaries to area third-graders and volunteers do remedial reading in the schools. They've also provided funds for a community park.

"We certainly want to give something back to the community," says Kinder. "The community's always been supportive of us and we try to add value to the community. What makes this so much better is the spirit of our employees who want to get involved."

Like any 24/7 manufacturing operation, dependable electricity is a must. No qualms from Kinder on that point.

"Santee Cooper is an outstanding power provider," Kinder says. "I mean that. We truly have a great relationship with Santee Cooper and they have been instrumental in our new project. They've agreed to put in a new substation and maintain it."

Giant Cement Holdings Inc. is a subsidiary of Spain's Cementos Portland S.A., which acquired the Summerville, S.C. based firm three years ago. Giant was originally founded in Egypt, Pa. in 1883.

"The cement industry in the United States is 80 percent owned by foreign companies," says Kinder. "We recognized in 1998 that in order to be competitive in this truly global economy, we really needed to have a strong partner behind us. The acquisition is allowing us to be more competitive and this is a benefit of having a $4 billion parent company behind you."

It's this backing, a motivated labor force and an extremely low turnover rate and leading-edge technology that should keep Harleyville as a cement center in the Southeast.

A mixture of pulverized limestone that emerges as a slurry from the raw mill and is fed into one of four kilns.

Supervisor Nils Boserup checks on the status of one of the 425-foot kilns that rotate at 70 revolutions per minute, heating the limestone material to a temperature of up to 3,500 degrees Fahrenheit.

"We provide infrastructure, it's what our country is built on," Kinder says. "When you need cement, there's no substitute."

Such was the need when the Santee Cooper Hydroelectric and Navigation project was constructed from 1939 to 1942. The country's largest land-clearing project at the time required 2,400,000 bags of cement and 3,144,100-cubic yards of poured concrete for a powerhouse and 42 miles of dams and dikes. It's good to know companies such as Giant stand ready when big projects come along.

Says Kinder, "We have a pretty simple philosophy, to add value to our customers and to add value to the community. The quality of cement is better than it's ever been and concrete is much more versatile than it's ever been. And we hope to be right here making it better for many, many years to come."

All about the Making of Cement...and then Concrete

The life cycle of cement consists of taking rock in the form of limestone, crushing and grinding it into a fine powder, baking it back into rock in a cement kiln, and grinding it once again into a powder that can be combined with other materials and water, making it into a material called concrete, which hardens to the solidity of rock.

In a nutshell, that's the description of the process offered by Terry Kinder, president and chief executive officer of Giant Cement Holding Co. Kinder explains that cement had its beginning in 1824. That's when Joseph Aspdin, a British stonemason, obtained a patent for the substance he produced in his kitchen.

The inventor heated a mixture of finely ground limestone and clay in his kitchen stove and ground the mixture into a powder to create a hydraulic cement—one that hardens with the addition of water.

Aspdin named the product Portland cement because it resembled a stone quarried on the Isle of Portland off the British coast. With his invention, Aspdin laid the foundation for today's Portland cement industry.

"Today, more than 95 percent of the cement produced is Portland Type I or Type I-II," Kinder says. Portland cement is primarily for construction and paving, while the other type, masonry cement, is for mortar used in masonry construction, he explains.

As to the step-by-step process for manufacturing cement, Kinder refers to the description provided by the Portland Cement Association, which represents cement companies in the United States and Canada. On their behalf, the organization conducts programs in research, education, market development and public affairs.

Quarry

For its raw materials, cement uses minerals containing the four essential elements for its creation—calcium, silicon, aluminum and iron.

Proportioning, Blending and Grinding

The raw materials are analyzed in the plant laboratory, blended in the proper proportion, and then ground even finer.

Plants grind the raw materials with heavy wheel-type rollers that crush the materials into powder against a rotating table. After grinding, the material is ready for the kiln or preheater, depending on plant type.

Preheater Tower

The preheater tower supports a series of vertical cyclone chambers through which the raw materials pass on their way to the kiln.

To save energy, modern cement plants preheat the materials before they enter the kiln. Rising more than 200 feet, hot gases exiting the kiln heat the raw materials as they swirl through the cyclones.

Kiln

Raw materials enter the huge rotating furnace called a kiln. It's the heart of the cement-making process—a horizontally sloped steel cylinder, lined with firebrick, turning slowly at about one to three revolutions per minute. The kiln is the world's largest piece of moving industrial equipment.

From the preheater, the raw materials enter the kiln at the upper end. The materials slide and tumble down the kiln through progressively hotter zones toward the flame. At the lower end of the kiln, fuels such as powdered coal, oil and waste materials feed a flame that reaches 3,400 degrees Fahrenheit. Here in the hottest part of the kiln, the raw materials reach about 2,700 degrees Fahrenheit and become partially molten.

The intense heat triggers chemical and physical changes. Expressed at its simplest, the series of chemical reactions converts the calcium and silicone oxides into calcium silicates, cement's primary constituent. At the lower end of the kiln, the raw materials emerge as a new substance—red-hot particles called clinker.

Clinker Cooler and Finish Grinding

The clinker tumbles onto a grate cooled by forced air. Once cooled, the clinker is ground into the gray powder known as Portland cement. To save energy, heat recovered from this cooling process is recirculated back to the kiln or preheater tower.

The clinker is ground in a ball mill — a horizontal steel tube filled with steel balls. As the tube rotates, the steel balls tumble and crush the clinker into a super-fine powder, which is considered Portland cement. The cement is so fine it will pass through a sieve that is fine enough to hold water. A small amount of gypsum is added during final grinding to control the set.

Bagging and Shipping

From the grinding mills, the cement is conveyed to silos, where it awaits shipment. Most cement is shipped in bulk by trucks and by rail. A small percentage of the cement is bagged for customers who need only small amounts or for the special uses such as mortar.

... and finally, the Making of Concrete:

In its simplest form, concrete is a mixture of paste and aggregates. The paste, composed of Portland cement and water, coats the surface of the fine and coarse aggregates. Through a chemical reaction called hydration, the paste hardens and gains strength to form the rock-like mass known as concrete.

Within this process lies the key to a remarkable trait of concrete: it's plastic and malleable when newly mixed, strong and durable when hardened.

These qualities explain why one material, concrete, can be used to build skyscrapers, bridges, sidewalks, superhighways, houses and dams.

Cement on the Web:

For an animated virtual tour of a cement manufacturing plant, and information about the process, visit the Web site for the Portland Cement Association at www.portcement.org.


SANTEE CANAL
THIS CANAL, TWENTY TWO MILES IN LENGTH, CONNECTS THE SANTEE AND COOPER RIVERS. CHARTERED IN 1786, CONSTRUCTION WAS COMMENCED IN 1793, AND COMPLETED IN 1800, UNDER THE DIRECTION OF COL. JOHN CHRISTIAN SENF, A NATIVE OF SWEDEN, AS CHIEF ENGINEER. THE CANAL WAS IN OPERATION UNTIL ABOUT 1850.

Old Santee Canal Park is Showpiece for Two Significant American "Firsts"

Did you know there is a very special place in Berkeley County, S.C., commemorating where the first true canal in the United States was constructed and used for a half century?

And did you know at this very special place naval history was made? It's the site where the first semisubmersible torpedo boat successfully used in combat was built.

If you aren't aware of these facts, you're not alone. Many people, including well-versed historians, simply don't know. The location is Moncks Corner, an early Colonial trading center and site of significant battles during the American Revolution. The place is the Old Santee Canal Park… where history and nature meet.

It's an extremely unique parcel of property, now bordering the man-made Tailrace Canal at the point where the west branch of the Cooper River begins on its journey to the port city of Charleston. High bluffs, uncommon in the Lowcountry, are marked by unusual formations of marl, a mixture of clay, sand and limestone. This area is sprinkled with rare plants—and fauna from ospreys to alligators.

***Left**: Historical marker along U.S. Highway 52 in Moncks Corner identifies where America's first true canal traversed the area in 1800.*

"What is significant about this place is how it's been shaped by man for nearly 250 years in ways that chronicle the history of not only South Carolina, but the nation," says naturalist Rudy Mancke and host of "NatureScene" the popular weekly program shown nationally and on the S.C. Educational Television Network. "And in this setting, you have nature and natural areas that are being preserved and cared for."

Instead of tents and Winnebagos, this park has a showcase 11,000-square foot interpretive center and four miles of trails and wooden boardwalks with opportunities to canoe through Biggin Creek. They beckon visitors to explore nature at their own pace over the black waters featuring scenic overlooks.

Close-up view of a bumblebee feeding on a succulent along one of the trails in the Old Santee Canal Park.

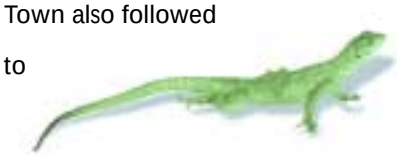
*A Green Anole (*anolis carolinesis*), one of the lizards found in the cypress swamp environment of the park, displays its extensible, pink throatfan.*

It was End of the Cherokee Path

The history of this 195-acre park began with trade. After the first permanent settlement in South Carolina was established at Charles Towne in 1670, an Indian trade almost immediately developed up the Cooper River.

Originally, this spot was referred to as "Stone Landing," named for the high grade of marl found near or on the surface of the soil. The name Stone Landing was dropped sometime in the 1700s. It became known as "Stony Landing," because of the stony outcroppings of marl.

This landing on Biggin Creek, emptying into the Cooper River, was extremely important to the commerce of the early colony. Supplies for the interior regions were brought by boat to Stony Landing, the furtherest navigable point on the river's west branch. Pack animals and later, wagons, moved goods on the Cherokee Path. Conversely, goods from the interior bound for Charles Town also followed this route. (The spelling 'Charles Towne' was changed to 'Charles Town' when the settlement moved from



Albermarle Point to the peninsula in 1680.) Indian carriers, pack animals and eventually wagons used the Cherokee Path.

The Cherokee Path went through the Congaree, Cherokee, High Hills of the Santee and Waxhaw areas—and then westward to the Mississippi River.

"Stony Landing was a commercial 'portal' to the interior of South Carolina, the Appalachians and beyond," says Mary Bell, the park's historical education coordinator. "It is a historical corridor of our state and Stony Landing's role has really not been emphasized."

Rice planters in upper Berkeley County hauled their rice to Stony Landing to be loaded on flatboats or schooners and transported to Charles Town. While waiting for a boat, rice planters stored their crop in a large warehouse.

By 1732, Gabriel Laban was operating a general store at the landing and sold dry goods and liquor at "reasonable prices." His enterprise was in operation for approximately 20 years.

Around 1759 a French-born physician, Dr. Lewis Motte, practiced medicine at Stony Landing. His presence was surely a godsend to the local populace dependent upon Charles Town for such care.

Santee Canal Became America's First "Superhighway"

The large volume of riverboat traffic increased around 1800 with the completion of the Santee Canal and the development of new roads.

As early as 1770, the idea of a waterway connecting the Cooper and Santee rivers was envisioned by South Carolina legends: Henry Laurens, Brig. Gen. Francis Marion and William Moultrie, also a Revolutionary War general and later governor.

That same year, Henry Mouzon Jr. was employed to survey several routes. Two years later, Mouzon, a native of Williamsburg County, presented maps with five possible routes.

The Revolutionary War interrupted plans for construction. But in January 1782, with Charles Town still in enemy hands, Gov. John Rutledge appointed seven commissioners to select the best route.

A charter was granted and a board of directors was selected. In addition to Moultrie and Marion, board members of the Santee Canal Co. included John Huger, Henry Laurens Jr., Theodore Gaillard and Theodore Gourdin.

In this scene from the South Carolina ETV historical documentary, "Santee Canal—America's First Superhighway," Col. John Christian Senf oversees construction of the 22-mile canal.

Gov. Moultrie asked President George Washington for his advice and assistance. The president wrote to French general and statesman Marquis de Lafayette on obtaining the services of a French engineer. However, in 1787 the services of a Swede, Col. John Christian Senf, were secured. He had served with American forces in the Revolution and became the project's chief engineer and supervisor.

With the invention of the cotton gin in 1793, the largest acreages of cotton were planted by Moultrie and Capt. Peter Gaillard. This made the canal a more obvious solution to moving crops more quickly to Charles Town, now called Charleston.

Workers pole one of the flat-bottomed boats through the canal in this painting displayed in the interpretive center.

Work on the canal also began in 1793 with 10 laborers. By year's end a work force of 1,000, comprised mainly of slaves and some skilled artisans, labored through malaria-ridden swamps. Many gave their lives building the canal.

This interpretive-center diorama shows one of the barges laden with cotton and other goods as it passes through one of the 11 locks on the famous canal.

It took seven years to complete the waterway, which was 22 miles in length, 35-feet wide with a depth of 5 and one-half feet. It began two miles below Greenland Swamp on the Santee River, went through Biggin Creek and entered the Cooper River at Stony Landing two miles east of Moncks Corner.

By connecting the Santee and Cooper rivers, the Santee Canal became

the first true canal in the United States. In essence, it was the first Santee Cooper project, connecting the two river systems for the purpose of promoting commerce.

"Until the Santee Canal," says Bell, "canals were dug to bypass rapids or waterfalls and they connected to the same body of water. It was a remarkable engineering achievement even by today's standards, and the most modern means of transportation created at that time."

From the Santee River, the canal rose 34 feet by one double-lift and two single-lift locks to the summit section. From there, it dropped 69 feet by one double-lift and six single-lift locks to the tidewater of the Cooper River.

Boats had to pass through 10-foot by 60-foot masonry locks. Boats and barges up to 22 tons in weight were pulled through the canal by horses and mules using 10-foot wide towpaths on both sides of the canal. They later were replaced by poling through the canal. Gates were provided to raise or lower the level of the water to lift or lower the boats at the locks.

There were two large and two small turning basins, eight aqueducts and 25 overfalls and floodgates. A 16-foot wide bridge went over every lock and there were seven public and private bridges.

The canal was generally operated from October through June, bringing cotton and other harvested crops to Charleston. On the return trip, planters brought supplies purchased in Charleston back home.

The final cost of the project, slightly over $650,000, was an enormous sum at the time. About midway through the project's construction, money was scarce and the General Assembly authorized a lottery, conducted in Charleston, to raise funds for the project's completion.

The emergence of the railroad, steamships and drought, spelled the end of the canal. By 1850, the General Assembly revoked its charter. Ironically, the board of directors tasked with terminating operation of the canal had earlier seen its potential demise and in 1827 chartered the South Carolina Canal and Railroad Co., which resulted in the

The brick walls of Lock Number 1, adjacent to the Santee River, are mostly overgrown by vegetation but still stand as a vestige of the historic Santee Canal.

development of the "Best Friend," South Carolina's first railroad, running from Charleston to Hamburg. They truly saw themselves as being in the transportation business, in whatever mode was needed to benefit the Palmetto State.

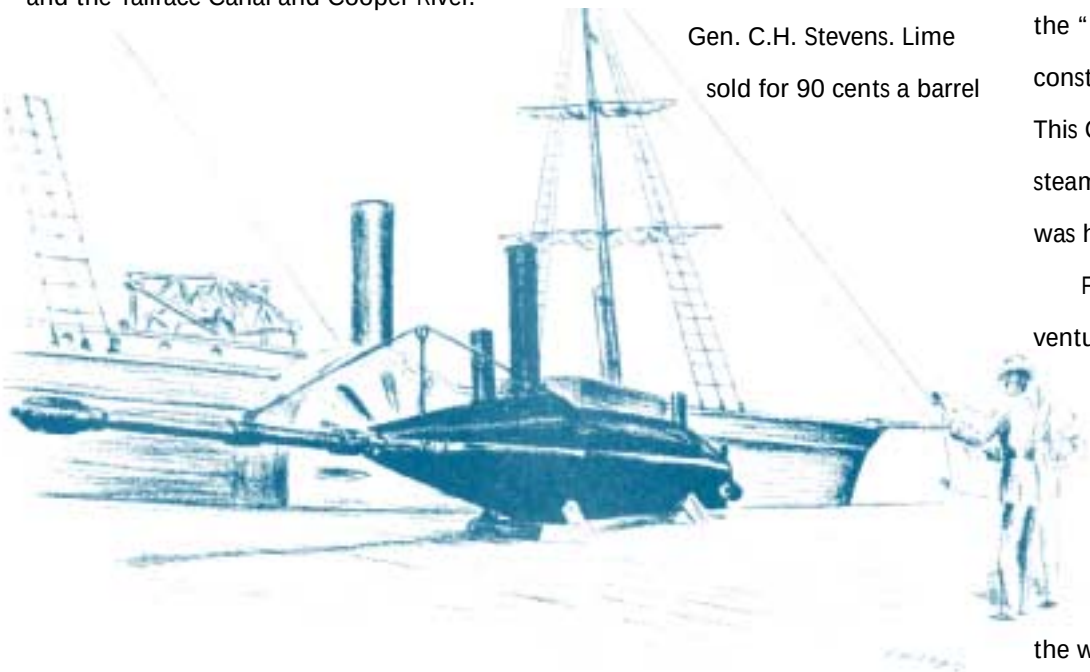
During the canal's heyday Stony Landing was a bustling place, and around 1843, Charleston merchant John Dawson constructed the two-story Stony Landing House. It still stands majestically overlooking Biggin and Wadboo creeks, and the Tailrace Canal and Cooper River.

The Civil War Era

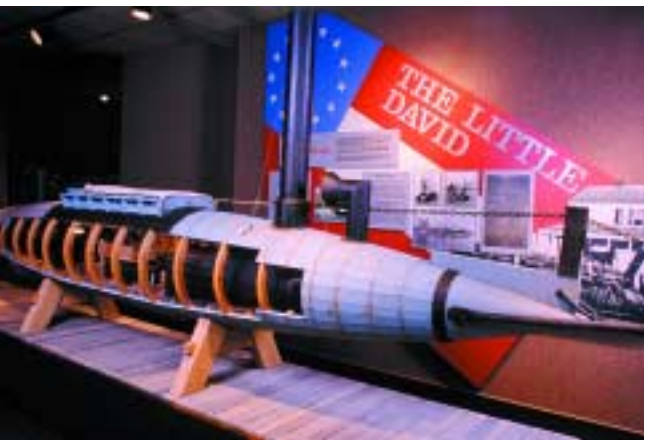
During the time Dr. St. Julien Ravenel owned the land, he experimented with the use of marl to produce lime. By 1860, a lime and cement works was in operation. Called the Colleton Lime Works, it was owned by Dr. Ravenel and Gen. C.H. Stevens. Lime sold for 90 cents a barrel and was considered a top quality fertilizer and an ingredient for gun-powder during the Civil War.

In 1863, in extreme secrecy, the "David" or "Little David" was constructed at the landing site. This Confederate torpedo boat, a steam-powered semisubmersible craft, was homeported in Charleston.

From its Cooper River dock, it ventured forth on the night of Oct. 5, 1863. The vessel exploded a damaging charge of gunpowder from its spar on the side of the USS New Ironsides, then one of the more formidable warships in the world. It didn't sink the Navy ship, but it did put the vessel out of service for



The cut-away replica of the "Little David" in the interpretive center displays working parts including the steam-powered engine that propelled the semisubmersible vessel.



a period of time. Like it's relative, the Mobile, Ala.-built H.L. Hunley, the David greatly advanced naval warfare.

"The story of the 'Little David' deserves its place in history right alongside the Hunley submarine," Bell says. "There are very interesting parallels. Most people do not know the David actually towed the Hunley on training missions on at least three occasions. The practice was stopped, one account states, because the Hunley's armed torpedo tip almost touched the David during a training exercise and that would have blown up both vessels."

A replica of the "Little David" is located on the grounds of the Berkeley Museum, which is located within the park gates.

Following the Civil War, bricks were made at Stony Landing and church and school-sponsored picnics were held on the grounds.

The "Little David" is shown attacking the U.S.S. New Ironsides in this interpretive center display.

Stony Landing House, constructed around 1843, is located at the point where the 22-mile Santee Canal connected to Biggin Creek and the Cooper River.

The Modern Era

In 1919, state Sen. E. J. Dennis bought Stony Landing, which then comprised 622 acres, considerably less than the 2,319 acres John Dawson acquired in 1839. His son, Rembert C. Dennis, also a long-time Berkeley County senator, spent some of his boyhood living in the Stony Landing House.

In the mid-1980s, Santee Cooper initiated a plan to develop Stony Landing into the Old Santee Canal State Park, to be operated by the S.C. State Department of Parks, Recreation and Tourism. Completed in 1989, the project was funded by Santee Cooper.

In mid-1999, Santee Cooper assumed the park's operation and the Old Santee Canal State Park became the Old Santee Canal Park.

"The site is a natural sanctuary for wildlife and habitat for blue heron and osprey," says Assistant Park Director Larry Motes, an entomologist who conducts educational programs aimed at all ages. "My big goal is to show how people are connected to the natural history of the park."

Motes, an expert in insects, does a program called "Incredible Insects," one of five major programs that include such names as "Remarkable Reptiles," "Terrific Trees," "Swamp Soup" and "Wonderful Wetlands." These programs teach by allowing participants to touch and feel and be in a natural setting while learning.

"What you have here is an amazing diversity of trees, about 60 species in all," Motes says. "You have 38 species of snakes and an incredible population of insects."

Bell's programs include "Child's Life," about the life of Lowcountry youngsters 200 years ago, "History in the Sandbox," "Who, What, Where, When and Why?" and "Lunch Box Sort," focusing on the importance of recycling.

Approximately 3,000 school-age children visit the park annually. Another 3,000 Berkeley County youngsters participate in the annual two-day Backyard NatureScope field day. Total park attendance is approaching 30,000 visitors annually.

Wildlife observation points are located along the edges of picturesque Biggin Creek, which abound in a wide variety of flora and fauna.

Under Santee Cooper's stewardship, the park's natural integrity has been maintained while hosting events to make the park more a part of the community. The annual Festival in the Park, held around the Fourth of July, is a long-time mainstay now accompanying a slate of newer annual events such as the Shuckin' in the Park Oyster Festival held in March and the Pickin' in the Park Bluegrass Festival slated every October. Coming Nov. 9 and 10 is the first Lowcountry Antique Tractor and Engine Show.

"We have tremendous potential here and we are beginning to see that potential realized," says Park Director Wayne Lee. "The State newspaper recently visited, did a nice story and termed us an 'undiscovered gem'. Sandlapper magazine just did a nice story on the park. We know we're a little off the beaten path, but Charleston visitors can be here in less than 45 minutes and discover something historic, natural and totally unique."

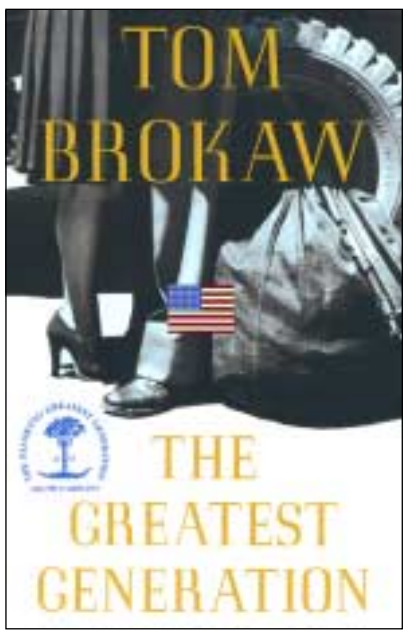
***Left**: The interpretive center blends into and reflects Old Santee Canal Park's natural environment. **Right**: Four miles of wooden walkways and trails meander through the cypress-swamp environment of the park and along the last one-mile section of the historic Santee Canal.*

NewSource

Santee Cooper Retirees Included in S.C. ETV "Palmetto's Greatest Generation" Project

Two Santee Cooper retirees, Bill Fletcher and Willie Varnish, are part of a S.C. Educational Television Network project. It's a program that adapts the concept of Tom Brokaw's best-seller, "The Greatest Generation," for public school classrooms.

A S.C. ETV crew interviewed the long-time employees on Aug. 29 in Moncks Corner.



Fletcher joined Santee Cooper in late December 1941 as a security guard. Armed with a Browning shotgun, he guarded the Santee Spillway. Fletcher retired after "44 years, six months and two days," he'll quickly tell you. He joined the Navy in 1943, serving as an electrician aboard an LST landing craft before being discharged and rejoining Santee Cooper in 1945.

"Santee Cooper has been good to me," the 85-year-old Moncks Corner resident said prior to his taping. He retired in 1986 as supervisor of System Control.

Varnish began his employment in October 1946 and retired at the end of June 1987 as a mechanic A. But the 79-year-old Varnish, like Fletcher and so many of that generation, had his life altered after Pearl Harbor.

An eye condition prevented him from enlisting in the Navy. Varnish ended up at the Charleston Naval Shipyard, doing a 30-month stint during World War II as a mechanic.

But his service to Santee Cooper actually began when he worked for a subcontractor planting grass on the slopes of the Pinopolis and Santee dams when the federally funded project was constructed from 1939 to 1942. It was the largest Works Project Administration project east of the Mississippi and at the time, the largest land-clearing project in North America. Approximately 171,000 acres were cleared for the lakes, and a total of 12,670 workers were employed on the project.

"I planted grass from the West Dike to the Santee Dam south of Manning," Varnish recalls. "I wouldn't swap my time at Santee Cooper for anything in the world. Santee Cooper brought prosperity to this Lowcountry."

S.C. ETV combed the state videotaping South Carolinians. They are part of the Depression-era, World War II generation the long-time "NBC Nightly News" anchor based his book upon. Directly or indirectly, these were the men and women who fought the Second World War, saving the world from the totalitarianism dictatorships of Nazism and fascism.

"South Carolina ETV will air the one hour documentary the week of Veterans Day during prime time," said Merideth Strawhorn in Gov. Jim Hodges office. The TV component is part of a bigger picture: providing 50,000 hardback special-edition copies to U.S. History students in South Carolina schools, a project started by the state's chief executive.

"The governor created this project to help teach the lessons of World War II and South Carolina's role in it," Strawhorn said. "ETV's involvement will showcase the determination and patriotism of those who humbly served and with another goal to promote a love of reading."

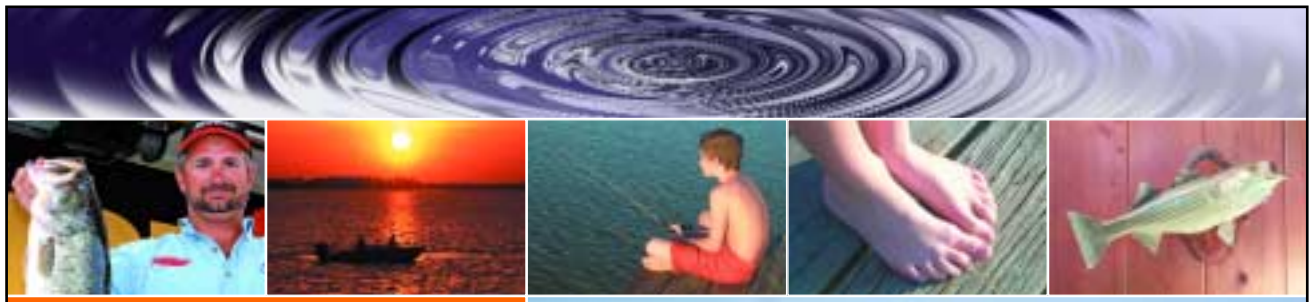
Lest we forget...

Constructing the Pinopolis Power Plant (renamed the Jefferies Hydroelectric Station in 1966) and the more than 42 miles of dams and dikes for the massive Santee-Cooper Hydroelectric and Navigation Project included a monumental pouring of concrete.

All of the wooden forms required to shape the 3.1 million cubic yards of cement used in the project were made on site. Shown here is one of the largest cement-mixing plants in the country, built on site to produce enough concrete for the construction.

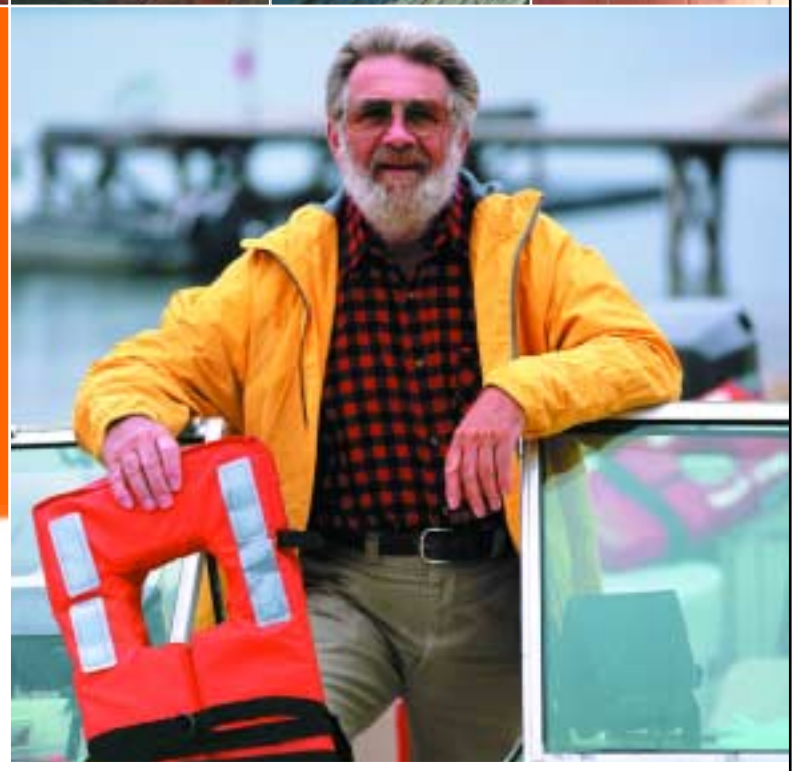
Before pouring the concrete, 40.5 million cubic yards of earth and 4.2 million cubic yards of limestone and marl were excavated and moved. In building the dams, powerhouse, lock and spillway, some 6,585 tons of structural steel and 15,800 tons of reinforcing steel were used.

When completed in 1942, this was the largest concrete pour in South Carolina history, and it exceeds the projected pour for the new Cooper River Bridge in Charleston.



"I make sure my business stays afloat. I never go out without a life vest."

Truman Lyon, Fishing Guide
Santee Cooper Lakes



Safe boating is a way of life for Truman Lyon, a professional fishing guide on Santee Cooper's lakes Marion and Moultrie. Safety should also be priority one for all recreational boaters and fishermen. So, before you visit our lakes, be sure to visit our special Web site below for tips on safe boating practices. And while you're surfing, feel free to explore links to all the other ways Santee Cooper works to make life better for everyone in South Carolina.

scwaters.com

Visit www.scwaters.com for more information on fishing and water/boating safety

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Dependable Power. Dependable People.